

CLAIMS

Sub B1  
1. A hydrotreating catalyst comprising a hydrogenation active metal component supported on a refractory porous carrier, wherein

median pore diameter determined by the nitrogen adsorption method is 8 to 20 nm, pore volume determined by the nitrogen adsorption method is 0.56 cm<sup>3</sup>/g or greater, and pore volume of pores having a pore diameter of 50 nm or larger determined by the mercury intrusion porosimetry method is 0.32 cm<sup>3</sup>/g or greater.

2. A hydrotreating catalyst according to Claim 1, wherein pore volume determined by the mercury intrusion porosimetry method is 0.87 cm<sup>3</sup>/g or greater.

3. A hydrotreating catalyst according to Claim 1, wherein the catalyst is used in demetallizing or deasphalting of heavy oil.

Sub B2  
4. A hydrotreating catalyst according to Claim 1, wherein pore volume of pores with a pore diameter of not less than 1,000 nm measured by the mercury intrusion porosimetry method is not more than 0.2 cm<sup>3</sup>/g.

*Sub B2*

5. A hydrorefining catalyst according to Claim 1, wherein bulk density is 0.52 cm<sup>3</sup>/g or less.

6. A hydrorefining catalyst according to Claim 1, wherein the catalyst comprises 2 to 6 wt% molybdenum and 0.5 to 2 wt% cobalt as the hydrogenation active metal components.

*Sub B3*

7. A hydrorefining catalyst according to Claim 1, wherein the catalyst comprises 0.5 to 1.5 wt% phosphorus or boron.

*Sub B4*

8. A hydrorefining catalyst according to Claim 1, wherein the catalyst is molded by extrusion molding.

*Sub B5*

9. A hydrorefining catalyst according to Claim 1, wherein the effective amount of metal deposition is 70 g or more per 100 g fresh catalyst.

10. A hydrorefining catalyst according to Claim 1, wherein the catalyst is used for demetallization treatment of heavy oil containing 45 ppm by weight or more of nickel or vanadium with respect to metal weight.

*Sub B6*

11. A hydrorefining catalyst according to Claim 1, wherein the catalyst is used for deasphalting treatment of heavy oil containing 3% or more asphaltene component.

12. A method of producing a hydrorefining catalyst comprising a hydrogenation active metal, comprising the steps of:

kneading a porous starting powder whose main component is  $\gamma$ -alumina and which has a pore volume of 0.75 cm<sup>3</sup> g/or greater and an mean particle diameter of 10 to 200  $\mu$ m to prepare a kneaded product;

molding and calcining said kneaded product; and

supporting the active metal component on the kneaded product or on the kneaded product after calcining.

13. A method of producing a hydrorefining catalyst according to Claim 12, wherein the  $\gamma$ -alumina is  $\gamma$ -alumina that has been obtained by calcining boehmite powder.

14. A method of producing a hydrorefining catalyst according to Claim 13, wherein the molding is performed by extrusion molding.

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